1. A method of forming finely sized carbide phase particles formed in situ in a molten metal or molten metal alloy, comprising:

(a) providing a molten composition consisting essentially of molten aluminum alloy and molten metal selected form the group consisting of Zr, V and combinations thereof;

(b) providing a chloride salt containing fine carbon particles; and

(c) reacting said chloride salt containing fine carbon particles in said molten aluminum metal liquid with said molten metal to form a uniform distribution of finely sized carbide particles formed and dispersed in-situ in an aluminum alloy matrix.

2. The method as set forth in claim 1 wherein said step of reacting said chloride salt containing carbon particles in said molten aluminum comprises vigorously stirring said molten composition and said chloride salt containing carbon particles to form a mixture of said molten metal in contact with a portion of said carbon particles at an elevated temperature for sufficient residence time to form a uniform distribution of finely sized (ceramic phase) metal carbide particles formed and dispersed in-situ in a metal matrix.

3. The method as set forth in claim 2 wherein said finely sized metal carbide particles comprise titanium carbide particles having an average particle diameter of less than about 0.3 microns formed in situ in metal.

4. The method as set forth in claim 2 wherein said finely sized metal carbide particles are selected form the group consisting of ZrC, VC and combinations thereof.

5. The method as set forth in claim 2 further comprising:

(d) controlling and selecting said salt to have a liquidus temperature lower than that of said molten aluminum metal liquid.

6. The method as set forth in claim 5 wherein said step of controlling and selecting said salt further comprises selecting said salt for the purpose of wetting said carbon particles.

7. The method as set forth in claim 6 wherein said residence time is less than one hour.

8. The method as set forth in claim 6 wherein said salt comprises chloride salts of alkali and alkaline earth metals.

9. The method as set forth in claim 8 wherein said salt comprises a eutectic melt of NaCl-KCl with minor amounts of $MgCl_2$ and $CaC1_2$.

10. The method as set forth in claim 9 wherein said salt has a melting point below about 600°C.

11. The method as set forth in claim 10 wherein said salt has a NaCl and KCl weight/weight ratio within the range of about 0.8-1.2, and the additives of $MgCl_2$ and $CaC1_2$ comprise up about 5-10% by weight of the salt mixture.

12. The method as set forth in claim 11 wherein said salt has a eutectic of about 600-700°C.

13. The method as set forth in claim 11 wherein said salt contains about 48% NaCl, 48% KCl, 2.2% $MgCl_2$, and 1.8% $CaC1_2$ by weight.

14. A method of forming finely sized carbide phase particles formed in situ in a molten aluminum metal or aluminum metal alloy comprising:

(a) providing a molten composition consisting essentially of molten aluminum alloy and molten metal selected form the group consisting of Zr, V and combinations thereof;

(b) providing a chloride salt containing carbon particles, wherein said salt comprises NaCl and KCl in a weight/weight ratio within the range of about 0.8-1.2 and of $MgCl_2$ and $CaCl_2$ in amounts comprising up to about 5-10% by weight of the salt mixture; and

(c) reacting said chloride salt containing carbon particles in said molten aluminum alloy by vigorously stirring said aluminum alloy and said chloride salt containing carbon particles to form a mixture of said molten metal liquid in contact with a portion of said carbon particles at an elevated temperature above the liquidus of the aluminum alloy to form a unagglomerated distribution of finely sized ceramic phase particles having an average particle diameter of less than about 0.3 microns formed and dispersed in-situ in an aluminum metal matrix.

15. The method as set forth in claim 14 wherein said finely sized metal carbide particles are selected form the group consisting of ZrC, VC and combinations thereof.

16. A method of forming finely sized carbide phase particles formed in situ in a molten aluminum metal or aluminum metal alloy comprising:

(a) providing a molten composition comprising a matrix liquid of aluminum or aluminum alloy metal and at least one carbide-forming element selected from the group consisting of Ti, Sc, Hf, Nb, Zr, Mo, and V;

(b) providing a chloride salt containing carbon particles, wherein said salt comprises NaCl and KCl in a weight/weight ratio within the range of about 0.8-1.2 and of $MgCl_2$ and $CaCl_2$ in amounts comprising up to about 5-10% by weight of the salt mixture; and

(c) reacting said chloride salt containing carbon particles in said molten aluminum alloy by vigorously stirring said aluminum alloy and said chloride salt containing carbon particles to form a mixture of said molten metal liquid in contact with a portion of said carbon particles at an elevated temperature above the liquidus of the aluminum alloy to form a unagglomerated distribution of finely sized ceramic phase particles having an average particle diameter of less than about 0.3 microns formed and dispersed in-situ in an aluminum metal matrix.

17. The method as set forth in claim 16 wherein said finely sized metal carbide particles are selected form the group consisting of ZrC, VC and combinations thereof.

18. A ceramic dispersoid in metal product, comprising:

(a) a matrix metal and

(b) a uniform distribution of formed and dispersed ~~ins-situ~~ in said metal matrix.

19. The ceramic dispersoid in metal product of claim 18 wherein said finely sized ceramic particles are formed by the process of:

(a) providing a molten composition comprising a matrix liquid of aluminum or aluminum alloy metal and at least one carbide-forming element selected from the group consisting of Ti, Sc, Hf, Nb, Zr, Mo, and V;

(b) providing a chloride salt containing carbon particles, wherein said salt comprises NaCl and KCl in a weight/weight ratio within the range of about 0.8-1.2 and of $MgCl_2$ and $CaC1_2$ in amounts comprising up to about 5-10% by weight of the salt mixture; and

(c) reacting said chloride salt containing carbon particles in said molten aluminum alloy by vigorously stirring said aluminum alloy and said chloride salt containing carbon particles to form a mixture of said molten metal liquid in contact with a portion of said carbon particles at an elevated temperature above the liquidus of the aluminum alloy to form a unagglomerated distribution of finely sized ceramic phase particles having an average particle diameter of less than about 0.3 microns formed and dispersed in-situ in an aluminum metal matrix.

20. The ceramic dispersoid in metal product of claim 18 wherein said finely sized metal carbide particles are selected form the group consisting of ZrC, VC and combinations thereof.

21. The ceramic dispersoid in metal product of claim 18 wherein said matrix metal is aluminum or an aluminum alloy.